

Dr. Robert E. Briggs

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Educational Background:

1975-1978 Iowa State University; Animal Sciences Pre-Vet
1978-1982 Iowa State University; DVM 1982
1982-1988 Iowa State University; MS 1988

Research Experience:

1982-1985 Postdoctoral Associate, Respiratory Disease of Cattle Research, USDA, ARS, NADC
1985-present Veterinary Medical Officer, Respiratory Tract Diseases of Ruminants, USDA, ARS, NADC

Dr. Briggs has studied bacterial respiratory disease of cattle and sheep for the past 18 years. In the past 8 years he has focused on molecular aspects of *P. haemolytica*, *P. multocida*, and *H. somnus*, the principal bacterial etiologic agents involved in respiratory disease of cattle. These efforts resulted in techniques that for the first time made it possible to genetically engineer *P. haemolytica* and *H. somnus*. Dr. Briggs recently developed patented DNA delivery vehicles which now allow routine construction of mutants of each of the bacterial agents with or without residual foreign DNA sequences. Using these techniques, genetically engineered products have been produced from each bacterium which have proven useful as attenuated live vaccines and for determination of the role played in disease by important bacterial virulence factors. Modified-live products were made which have proven effective mucosal vaccine candidates against shipping-fever of cattle in laboratory and field trials. A number of products were constructed which have demonstrated excellent efficacy in a multi-valent vaccine used in sheep and goats, including an intranasally-delivered vaccine for pasteurellosis in bighorn sheep.

Invitations in last 6 years:

Invited to Mallinckrodt Veterinary, Mundelein, IL, June, 1995, to present ongoing research on construction of modified-live vaccine strains.

Invited to Oxford Animal Health, Worthington, MN, July, 1995, to present ongoing research on construction of modified-live vaccine strains.

Invited to National Cattlemen's Beef Association Annual Convention in Charlotte NC, February, 1998, to present ongoing research on mucosal *P. haemolytica* vaccine.

Invited to Schering-Plough Animal Health, Elkhorn, NE, October 1998, to present ongoing research on oral vaccination of cattle.

Invited to Pfizer Central Research, Groton, CT, June, 1999, to present research findings on oral vaccination against shipping-fever.

Invited to Schering-Plough Animal Health, San Diego, CA, October 1999, to present ongoing research on mucosal vaccination strategies.

Invited to USAHA meeting in San Diego, CA, October 1999, to present results of research on mucosal *P. haemolytica* vaccine.

Invited to USAHA meeting in Birmingham, AL, October 2000, to present progress on mucosal *P. haemolytica* vaccine.

Ad hoc reviewer for USDA NRI Competitive Grants Program, 1997, 1998, 1999, 2000.

Referee for the journal "Vaccine", 1999, 2000.

External reviewer for Idaho Board of Education Research Center Grant Program, 1998.

Refereed publications in last 5 years:

Frank G. H., R. E. Briggs, R. W. Loan, C. W. Purdy, and E. S. Zehr. Respiratory tract disease and mucosal colonization by *Pasteurella haemolytica* in transported cattle. Am. J. Vet. Res. 57: 1317-1320. 1996.

Briggs R. E., and F. M. Tatum. *Pasteurella haemolytica* Transformants. US Patent 5,587,305 issued December 24, 1996.

Sanders J. D., Y. Tagawa, R. E. Briggs, and L. B. Corbeil. Transformation of a virulence associated gene of *Haemophilus somnus* into a strain lacking the gene. FEMS Microbiol. Letters. 154:251-258. 1997.

Briggs R. E., and F. M. Tatum. *Pasteurella haemolytica* restriction endonuclease and methyltransferase. US Patent 5,683,900 issued November 4, 1997.

Briggs R. E., and F. M. Tatum. DNA encoding *Pasteurella haemolytica* *PhaI* restriction endonuclease and methyltransferase. US Patent 5,693,777 issued December 2, 1997.

Briggs R. E., and F. M. Tatum. Chimeric plasmid for introduction of DNA into *Pasteurella haemolytica*. US Patent 5,733,780 issued March 31, 1998.

Tatum F. M., R. E. Briggs, S. S. Sreevatsan, E. S. Zehr, S. Ling Hsuan, L. O. Whiteley, T. R. Ames, and S. K. Maheswaran. Construction of an isogenic leukotoxin deletion mutant of *Pasteurella haemolytica* serotype 1: characterization and virulence. Microb. Pathog. 24: 37-46, 1998.

Briggs R. E., G. H. Frank, C. W. Purdy, E. S. Zehr, and R. W. Loan. Rapid spread of a unique plasmid of *Pasteurella haemolytica* serotype 1 among shipped calves. Am. J. Vet. Res. 59: 426-430, 1998.

Briggs R. E., G. H. Frank, and E. S. Zehr. Development and testing of a selectable challenge strain of *Pasteurella haemolytica* for studies of upper-respiratory colonization of cattle. *Am. J. Vet. Res.* 59: 401-405, 1998.

Straus D. C., C. W. Purdy, R.W. Loan, R. E. Briggs, and G. H. Frank. In vivo production of neuraminidase by *Pasteurella haemolytica* in market stressed cattle after natural infection. *Current Microbiology* 37:240-244. 1998.

Purdy, C. W., Straus, D. C., Loan R. W., Briggs, R. E., Parker, D. B., Auvermann, B., Chirase, N., Storz, J., Williams, P. B. Analysis of endotoxin in feedyard air and playas: Endotoxin effect on market stressed feeder calves. pp. 2-3. In *Proc. High Plains Beef Conference: Health, Nutrition and Environment*. 1998.

Briggs R. E., and F. M. Tatum. Molecular genetic construction of vaccine strains of *Pasteurellaceae*. U.S. Patent 5,840,556 issued November 24, 1998.

Briggs R. E., and F. M. Tatum. Construction of *Pasteurella haemolytica* vaccines. U. S. Patent 5,824,525 issued October 20, 1998.

Briggs R. E., and F. M. Tatum. Construction of *Pasteurella haemolytica* vaccines. U. S. Patent 5,849,305 issued December 15, 1998.

Lehmkuhl H. D., R. E. Briggs, and R. C. Cutlip. Survey for antibodies to bovine adenoviruses in six- to nine-month-old feedyard cattle. *Am J Vet Res* 59:1579-1580. 1999.

Storz, J., Purdy, C.W., Xiaoqing, L., Burrell, M., Truax R.E., Briggs, R.E., Frank, G.H., and Loan, R.W. Isolation of respiratory bovine coronavirus, other cytocidal viruses, and *Pasteurella* spp from cattle involved in two natural outbreaks of shipping fever. *Journal of the American Veterinary Medical Association*. 216:1599-1604. 2000.

Frank G. H., R. E. Briggs, R. W. Loan, C. W. Purdy, and E. S. Zehr. Effects of tilmicosin treatment on *Pasteurella haemolytica* organisms in nasal secretion specimens of calves with respiratory tract disease. *Am J Vet Res* 61:525-529. 2000.

Fulton, Robert W., Purdy, C.W., Confer, A.W., Saliki, J.T., Loan, R.W., Briggs, R.E., and Burge, L.J. Bovine viral diarrhea viral infections in feeder calves with respiratory disease: Interactions with *Pasteurella* spp., parainfluenza-3 virus, and bovine respiratory syncytial virus. *The Canadian Journal of Veterinary Research*. 64:151-159. 2000.

Leite, F., Brown, F.J., Sylte, M.J., Briggs, R.E. and Czuprynski, C.J. Recombinant Bovine Interleukin-1 Beta Amplifies the Effects of Partially Purified *Pasteurella haemolytica* Leukotoxin on Bovine Neutrophils in a Beta-2-Integrin-Dependent Manner. *Infection and Immunity*. 68:5581-5586. 2000.

Storz, J., Lin, M., Purdy, C. W., Chouljenko, V. N., Kousoulas, K. G., Enright, F. M., Gilmore, W. C., Briggs, R. E., and Loan, R. W. Coronavirus and *Pasteurella* infections in bovine shipping fever pneumonia and Evans' criteria for causation. *Journal of Clinical Microbiology*. 38:3291-3298. 2000.

Purdy, C. W., Loan, R. W., Straus, D. C., Briggs, R. E., and Frank, G. H. Conglutinin and immunoconglutinin titers in stressed calves in a feedlot. American Journal of Veterinary Research. 61:1403-1409. 2000.